

Scope of Each Footprint

Table 1. Industry Sectors Selected for Study	
Coal, Metal Ore, and Nonmetallic Mineral Mining NAICS 212	
Food and Beverage	
NAICS 311	Food
NAICS 312	Beverage and Tobacco Products
Textiles	
NAICS 313	Textile Mills
NAICS 314	Textile Product Mills
NAICS 315	Apparel
NAICS 316	Leather and Allied Products
Forest Products	
NAICS 321	Wood Products
NAICS 322	Paper
Petroleum Refining NAICS 334110	
Chemicals NAICS 325	
Plastics and Rubber Products NAICS 326	
Glass and Glass Products	
NAICS 3272	Glass and Glass Products
NAICS 3296	Mineral Wool
Cement NAICS 327310	
Iron and Steel Mills NAICS 333111	
Alumina and Aluminum NAICS 3313	
Foundries NAICS 3315	
Fabricated Metals NAICS 332	
Heavy Machinery NAICS 333	
Computers, Electronics, Appliances, Electrical Equipment	
NAICS 334	Computer and Electronic Products
NAICS 335	Electrical Equipment, Appliances
Transportation Equipment NAICS 336	

Source: North American Industrial Classification System, Office of Management and Budget, 1997.

The footprint analysis looks at a large subset of the mining and manufacturing sector, with the objective of capturing the bulk share of energy consumption. Table 1 lists the industrial sectors covered and defines the sixteen groupings selected for energy footprint analysis. Groups are organized by their respective NAICS (North American Industrial Classification System) codes. NAICS descriptions of the specific products manufactured in each sector are provided below.

Industries were selected based on their relative energy-intensities, contribution to the economy, and relative importance to energy efficiency programs. Industries not selected for individual energy footprint analysis include oil and gas extraction, coal products, printing facilities, furniture, and miscellaneous unclassified manufacturing. However, with the exception of oil and gas extraction, energy consumption for these industries is included in the overall manufacturing energy footprint.

NAICS Descriptions

311 – Food Manufacturing

Establishments in the Food Manufacturing subsector transform livestock and agricultural products into products for intermediate or final consumption by humans or animals. The food products manufactured in these establishments are typically sold to wholesalers or retailers for distribution to consumers, but establishments primarily engaged in retailing bakery and candy products made on the premises not for immediate consumption are included.

312 – Beverage and Tobacco Product Manufacturing

Industries in the Beverage and Tobacco Product Manufacturing subsector manufacture beverages (alcoholic and nonalcoholic) and tobacco products. Redrying and stemming tobacco is included in the tobacco products sector while ice manufacturing is included with nonalcoholic beverage manufacturing because it uses the same production process as water purification.

313 – Textile Mills

Industries in the Textile Mills subsector group include establishments that transform a basic fiber (natural or synthetic) into a product, such as yarn or fabric, which is further manufactured into usable items, such as apparel, sheets, towels, and textile bags for individual or industrial consumption. The further manufacturing may be performed in the same establishment and classified in this subsector, or it may be performed at a separate establishment and be classified elsewhere in manufacturing.

314 – Textile Product Mills

Establishments in the Textile Product Mills subsector group manufacture textile products (carpets, rugs, linens, rope, twine, etc), excluding apparel. With a few exceptions, these industries generally purchase fabric to cut and sew into the final nonapparel textile products.

315 – Apparel Manufacturing

Industries in the Apparel Manufacturing subsector group are involved in two manufacturing processes: (1) the manufacture of garments using purchased fabric and cutting and sewing, and (2) the manufacture of garments in establishments that first knit fabric and then cut and sew the fabric into a garment. Knitting, when done alone, is classified in the Textile Mills subsector (313).

316 – Leather and Allied Product Manufacturing

Establishments in the Leather and Applied Product Manufacturing subsector transform hides into leather by tanning or curing and fabricating the leather into products for final consumption. It also includes the manufacture of similar products from other materials, including products (except apparel) made from “leather substitutes,” such as rubber, plastics, or textiles. Rubber footwear, textile luggage, and plastic purses or wallets are examples of “leather substitute” products included in this group. The products made from leather substitutes are included in this subsector because they are made in similar ways leather products are made, and they are produced in the same establishments so it is not practical to separate them.

321 – Wood Product Manufacturing

Industries in the Wood Product manufacturing subsector manufacture wood products, such as lumber, plywood, veneers, wood containers, wood flooring, wood trusses, manufactured homes (i.e., mobile homes), and prefabricated wood buildings.

322 – Paper Manufacturing

Industries in the Paper Manufacturing subsector make pulp, paper, or converted paper products such as paperboard containers, paper bags, and tissue paper. The manufacturing of these products is grouped together because they constitute a series of vertically connected processes and more than one is often carried out in a single establishment.

324110 – Petroleum Refineries

This industry comprises establishments primarily engaged in refining crude petroleum. Petroleum refining involves one or more of the following activities: (1) fractionation; (2) straight distillation of crude oil; and (3) cracking.

325 – Chemical Manufacturing

The Chemical Manufacturing subsector is based on the transformation of organic and inorganic raw materials by a chemical process and the formulation of intermediate or end products. Exceptions include beneficiating operations such as copper concentrating, crude petroleum refining, and aluminum oxide production that are covered in other subsectors.

326 – Plastics and Rubber Products Manufacturing

Industries in the Plastics and Rubber Products Manufacturing subsector make goods by processing plastic materials and raw rubber. Plastics and rubber are combined in the same subsector because plastics are increasingly being used as a substitute for rubber; however, the subsector is generally restricted to the manufacture of products made of just one material, either solely plastics or rubber. Footwear and furniture manufacturing are therefore covered elsewhere.

3272 – Glass and Glass Product Manufacturing

This industry comprises establishments primarily engaged in manufacturing glass and/or glass products. They may start with silica sand or cullet, or purchased glass. Glass products that are classified elsewhere include glass wool (fiberglass), optical lenses, ophthalmic lenses, and fiber optic cable.

327993 – Mineral Wool

This industry comprises establishments primarily engaged in manufacturing mineral wool and mineral wool insulation products made of such siliceous materials as rock, slag, and glass or combinations thereof.

327310 – Cement Manufacturing

Establishments classified in this subsector are primarily engaged in manufacturing Portland, natural, masonry, pozzalanic, and other hydraulic cements. Establishments primarily involved in mining, quarrying, or manufacturing lime or manufacturing of ready-mix or dry mix concrete are classified elsewhere.

331111 – Iron and Steel Mills

This industry comprises establishments primarily engaged in one or more of the following: (1) direct reduction of iron ore; (2) manufacturing pig iron in molten or solid form; (3) converting pig iron into steel; (4) making steel; (5) making steel and manufacturing shapes (e.g., bar, plate, rod, sheet, strip, wire); and (6) making steel and forming tube and pipe. Establishments primarily engaged in manufacturing ferroalloys or operating coke ovens are classified elsewhere.

3313 – Alumina and Aluminum Production and Processing

This industry is composed of establishments primarily engaged in one or more of the following: (1) refining alumina; (2) making (i.e., the primary production) aluminum from alumina; (3)

recovering aluminum from scrap or dross; (4) alloying purchased aluminum; and (5) manufacturing aluminum primary forms (e.g., bar, foil, pipe, plate, rod, sheet, tube, wire).

3315 – Foundries

This industry group comprises establishments primarily engaged in pouring molten metal into molds or dies to form castings. Establishments making castings and further manufacturing, such as machining or assembling, a specific manufactured product are classified in the industry of the finished product. When the production of the primary metal is combined with the casting, the establishment is classified in sector 331 with the primary metal being made.

332 – Fabricated Metal Product Manufacturing

Industries in the Fabricated Metal Product Manufacturing subsector transform metal into intermediate or end products, other than machinery, computers and electronics, metal furniture, and metal products fabricated elsewhere. Important fabricated metal processes include forging, stamping, bending, forming, machining, welding, and assembling.

333 – Machinery Manufacturing

Establishments in the Machinery Manufacturing subsector create end products that apply mechanical force, such as the application of gears and levers, to perform work. Although this subsector uses processes similar to those used in Fabricated Metal Product Manufacturing (332), machinery manufacturing is different because it typically employs multiple metal forming processes in manufacturing the various parts of the machine. In addition, complex assembly operations are an inherent part of the production process.

334 – Computer and Electronic Product Manufacturing

Industry establishments in this subsector manufacture computers, computer peripherals, communications equipment, and similar electronic products, and components for such products.

335 – Electrical Equipment, Appliance, and Component Manufacturing

Industry establishments in this subsector manufacture products that generate, distribute, and use electrical power. Establishments are grouped into Electric Lighting Equipment, Household Appliances, Electrical Equipment (motors, generators, transformers, etc), and Other Electrical Equipment and Component Manufacturing.

336 – Transportation Equipment Manufacturing

Industries in the Transportation Equipment Manufacturing subsector produce equipment for transporting people and goods. Although transportation equipment is a type of machinery, an entire subsector is devoted to this activity because of the significance of its economic size in all three North American countries.